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10/790,404	03/01/2004	Richard Andrew Holland	120478	1472

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EXAMINER	
LO, SUZANNE	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/790,404	HOLLAND, RICHARD ANDREW	
	Examiner	Art Unit	
	Suzanne Lo	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8, 66-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 66-67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07/13/06*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *07/10/06*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-8 and 66-67 have been presented for examination.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 07/13/06 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 66-67 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, specifically, there is no tangible output.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-8 and 66-67 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the method steps of claims 1, 2, and 66-67 could be "non-stochastic" when steps include the phrase "particle distribution" wherein the term "distribution" is inherently stochastic.

All claims not specifically treated are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1-6 (1, 66-67) are rejected** under 35 U.S.C. 102(e) as being clearly anticipated by **Caflisch et al. (U.S. Patent No. 6,714,620).**

As per claim 1, a *direct computational* method of algorithmically simulating the transportation of particles through a medium, comprising the *non-stochastic* steps: a) establishing a set of initial particle and environmental conditions **(column 7, lines 15-54 and column 27, lines 14-24)**; b) creating a computational grid system of voxels from a physical object or system **(column 3, lines 36-40)**; c) establishing a plurality of ray sets of particle distributions with a computational algorithm **(column 17, line 60 – column 18, lines 6)**; d) using *said* ray sets and appropriate integration kernel to determine transport multipliers **(column 18, lines 7-16 and column 19, lines 45-57)**; e) initiating the simulated transportation of particles by applying a plurality of discrete particle distributions within voxel interaction tallies and/or upon voxel tally surfaces **(column 18, lines 17-34)**; f) applying the transport multipliers for transporting discrete particle tallies from the first plurality of voxels to a second plurality of voxels **(column 27, lines 14-24)**; g) continuing the particle tallies in voxels as the ray sets of particle distributions sequentially transport through the grid system of voxels until a predetermined limit is attained **(column 18, lines 24-34)**; h) compiling the particle interaction tallies from within computer memory locations and applying the interaction model to determine scattering, state and accumulated

interactions over a time epoch or generation **(column 10, lines 30-45)**; i) repeating steps (f-h) until interaction reaction rates and/or generational eigenvalue substantially converge **(column 28, lines 43-45 and column 38, lines 50-67)**; and j) computationally producing an output indicative of the simulated particle transport **(column 27, lines 43-47)**.

As per claim 2, a *direct computational* method of algorithmically simulating the transportation of particles through a medium, comprising the *non-stochastic* steps of: a) establishing a set of initial particle and environmental conditions **(column 7, lines 15-54 and column 27, lines 14-24)**; b) creating a computational grid system of voxels from a physical object or system **(column 3, lines 36-40)**; c) establishing a plurality of ray sets of particle distributions with a computational algorithm **(column 17, line 60 – column 18, lines 6)**; d) using ray sets and appropriate integration kernel to determine transport multipliers **(column 18, lines 7-16 and column 19, lines 45-57)**; e) initiating the simulated transportation of particles by applying a plurality of discrete particle distributions within voxel interaction tallies and/or upon voxel tally surfaces **(column 18, lines 17-34)**; f) applying the transport multipliers for transporting discrete particle tallies from the first plurality of voxels to a second plurality of voxels **(column 27, lines 14-24)**; g) compiling the particle interaction tallies from within computer memory locations and applying the interaction model to determine scattering, state and accumulated interactions over a time epoch or generation **(column 10, lines 30-45)**; h) repeating steps (f-h) until interaction reaction rates and/or generational eigenvalue substantially converge **(column 28, lines 43-45 and column 38, lines 50-67)**; and i) computationally producing an output indicative of the simulated particle transport **(column 27, lines 43-47)**.

As per claim 3, the method of claim 1 or 2, wherein the first voxel tally location associated with a set of multipliers is zeroed prior to undertaking step (g) **(column 26, lines 50-67)**.

As per claim 4, the method of claim 1 or 2, wherein the algorithmic computation for establishing a plurality of ray sets of particle distributions is performed using Monte Carlo techniques **(column 9, lines 30-41)**.

As per claim 5, the method of claim 1 or 2, further comprising a plurality of discrete phase space variables used to model nuclear radiation transport **(column 39, line 3-10)**.

As per claim 6, the method of claim 1 or 2, further comprising a plurality of discrete phase space variables used to model electromagnetic particle transport **(column 39, line 3-10)**.

As claims 66-67 are directed to a method with common method steps of claim 1, claims 66-67 are rejected under the same prior art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Caflisch et al. (U.S. Patent No. 6,714,620) **in view of Llinas et al. (U.S. Patent Application Publication 2003/0144432 A1).**

As per claim 7, Caflisch is directed to the method of claim 6, but fails to disclose wherein said electromagnetic particle transport comprises infrared waves, optical waves, UV waves *or* radio waves. Llinas teaches creating a stochastic model based on a refined Monte-Carlo approach (**[0023]**) and estimating particle temperatures by solving heat transfer equations (**[0025]**). Caflisch and Llinas are analogous art because they are both from the same field of endeavor, particle transfer simulation. Caflisch discloses simulating the transportation of particles through a medium for nuclear radiation and electromagnetic particle transport. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the particle transfer simulation method of Caflisch with the particle transport method of radiative heat transfer and infrared waves of Llinas in order to identify potential agglomeration mechanisms which occur during olefin polymerization (**Llinas, [0023]**).

As per claim 8, Caflisch is directed to the method of claim 1 or 2, but fails to disclose further comprising a plurality of discrete phase space variables used to model *radiative* heat transfer. Llinas teaches creating a stochastic model based on a refined Monte-Carlo approach (**[0023]**) and estimating particle temperatures by solving heat transfer equations (**[0025]**). Caflisch and Llinas are analogous art because they are both from the same field of endeavor, particle transfer simulation. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the particle transfer simulation method of Caflisch with the particle transport of radiative heat transfer and infrared waves of Llinas in order to understand potential agglomeration mechanisms during olefin polymerization (**Llinas, [0023]**).

Response to Arguments

7. The 35 U.S.C. 112, 2nd rejections of the previous office action mailed 05/04/06 have been withdrawn due to the amendments. The Examiner thanks the Applicant for providing support for the limitations containing the phrase "and/or" as recited in claims 1 and 2 but requires support for the "or" part of the phrase as the cited sections of the specification do not appear to provide support for an "or" enablement.

8. Applicant's arguments regarding the prior art rejection filed 07/13/06 have been fully considered but they are not persuasive.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

In response to applicant's arguments, the recitation of a direct computational method with non-stochastic steps has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections; the applicant's arguments are walking away from the claimed invention, the arguments are not geared towards the claim language. The American Heritage College Dictionary (4th ed.) defines the term "stochastic" as "involving or containing a random variable" but also defines the term

as "involving chance or probability". As many elements of the present invention as detailed in the Remarks involve probability – page 18 of Remarks, Monte Carlo that is hybridized with the present invention, and page 19 of Remarks, the invariant imbedded technique derives it data statistically – while the claims recites a method with non-stochastic steps, it is unclear how the present invention itself still reads on a non-stochastic computational method.

Also, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Invariant Imbedding on page 20 of Remarks, transforming a boundary-value problem on page 18 of Remarks, critical or supercritical particle multiplication on page 23 of Remarks) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

9. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. The prior art made of record is not relied upon because it is cumulative to the applied rejection. These references include:

1. U.S. Patent No. 6,175,761 B1 issued to Frandsen et al. on 01/16/01.

2. U.S. Patent No. 6,301,329 B1 issued to Surridge on 10/09/01.

3. U.S. Patent No. 6,029,079 issued to Cox et al. on 02/22/00.

11. All Claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne Lo whose telephone number is (571)272-5876. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2297. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Suzanne Lo
Patent Examiner
Art Unit 2128

SL
09/22/06

KAMINI SHAH
SUPERVISORY PATENT EXAMINER